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PCT App. No.: PCT/FI03/00183

Claim Listing

1-7. (cancelled)

8. (new) A web and a web coating device comprising:

a web having a first side and a second side opposite the first side, the web forming a substrate having applied to the first side a layer of powder formed of electrically charged particles; and

an electrically conducting roll forming a grounding electrode mounted for rotation and having an outermost insulating surface positioned engaged with the second side of the web opposite the layer of powder formed of electrically charged particles.

9. (new) The web and web coating device of claim 8, further comprising a charging electrode positioned opposite the layer of powder on the web where the web is engaged with the electrically conducting roll.

10. (new) The web and web coating device of claim 8, further comprising a heated hard roll, having an outer surface in nipping engagement with the electrically conducting roll, to define a nip therewith, the web passing through the nip and the first side of the web and the layer of powder thereon engaging the heated roll outer surface, the layer of powder forming a partly melted layer where it engages the heated hard roll.

11. (new) The web and web coating device of claim 10, wherein the heated hard roll and the electrically conductive roll are arranged to be at the same potential.

12. (new) The web and web coating device of claim 10, further comprising a resilient roll in nipping engagement with the heated roll and pressing the web and the layer of powder forming the partly melted layer against the heated roll.

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13. (new) The web and web coating device of claim 10 wherein the web comprises papermaking fibers.

14. (new) A method for coating a web comprising the steps of:
passing a continuous web having a first side and a second side between a charging unit of powdery particles, the charging unit having a corona charging electrode, and a rotating electrically conductive grounding roll having an electrically insulating surface so that the web second side is in contact with the electrically insulating surface;
applying to the first side of the web a layer of powdery particles which are charged in the charging unit while the web second side is engaged against the insulating surface of the grounding roll, wherein the grounding roll is held at a selected potential; and
finishing the powdery layer to form a coating on the web first side.

15. (new) The method of claim 14, further comprising the step of charging the powdery particles by tribocharging before applying the layer of powdery particles to the first side of the web.

16. (new) The method of claim 14, wherein the step of finishing the powdery layer comprises finishing the web in a calender stack comprising a rotating hard electrically conductive heated grounding roll and a resilient roll.

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17. (new) The method of claim 14, wherein the step of finishing the powdery layer comprises:

engaging the rotating electrically conductive grounding roll at a nip with a heated hard roll; and

passing the web through the nip with the first side of the web and the layer of powdery particles thereon engaging the heated hard roll outer surface, so that the layer of powder forms a partly melted layer where it engages the heated roll.

18. (new) The method of claim 17, wherein the heated hard roll and the electrically conductive grounding roll are at the same potential.

19. (new) The method of claim 17, wherein the step of finishing the powdery layer further comprises:

engaging the heated roll with a resilient roll at a nip; and

passing the web and the layer of powder forming the partly melted layer through the nip so as to press the web and the layer of powder forming the partly melted layer against the heated roll.

20. (new) The method of claim 14 wherein the continuous web comprises papermaking fibers.

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21. (new) A method for coating a web comprising the steps of:
passing a continuous web having a first side and a second side between a charging unit which employs tribocharging to charge powdery particles, and a rotating electrically conductive grounding roll having an electrically insulating surface so that the web second side is in contact with the electrically insulating surface;
applying to the first side of the web a layer of powdery particles which are charged in the charging unit while the second side is engaged against the insulating surface of the grounding roll, wherein the grounding roll is held at a selected potential; and
finishing the powdery layer to form a coating on the web first side.
22. (new) The method of claim 21, wherein the step of finishing the powdery layer comprises finishing the web in a calender stack comprising a rotating hard electrically conductive heated grounding roll and a resilient roll.
23. (new) The method of claim 21, wherein the step of finishing the powdery layer comprises:
engaging the rotating electrically conductive grounding roll at a nip with a heated hard roll; and
passing the web through the nip with the first side of the web and the layer of powdery particles thereon engaging the heated hard roll outer surface, so that the layer of powder forms a partly melted layer where it engages the heated roll.
24. (new) The method of claim 23, wherein the heated hard roll and the electrically conductive grounding roll are at the same potential.

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25. (new) The method of claim 21, wherein the step of finishing the powdery layer further comprises:

engaging the heated roll with a resilient roll at a nip; and
passing the web and the layer of powder forming the partly melted layer through the nip so as to press the web and the layer of powder forming the partly melted layer against the heated roll.

26. (new) The method of claim 21 wherein the continuous web comprises papermaking fibers.